NEW YORK STATE DEPARTMENT OF TRANSPORTATION MATERIALS BUREAU ALBANY, NY 12232 MATERIALS METHOD	MATERIALS METHOD - NY 8.2 ISSUE DATE - JUNE 1, 1977 SUPERSEDES NY 8.1 & 8.2 DATED 4/1/68

ASPHALT EMULSION - QUALITY ASSURANCE

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(Code 7.42-1-8.2)

I. SCOPE

This Method describes specific quality assurance procedures for asphalt emulsion intended for use in Department work. It encompasses:

1. Testing and certifying of tanks of asphalt emulsion by the supplier prior to its use in Department work.
2. Sampling by Department representatives of asphalt emulsion from the supplier's delivery vehicles or storage tanks to determine final acceptability.

For quality assurance procedures for:

1. Paving grade asphalt cements, see Materials Method N.Y. 8.1.
2. Asphalt cutbacks, asphalt fillers, asphalt subsealers and tars, see Materials Method 8.3.

II. CONTENTS

PAGE

GENERAL METHOD 2

DEFINITION OF TERMS 2

EVIDENCE OF ACCEPTABILITY 5

STEPS IN PROCEDURE..... 5

A. Testing, Certifying and Shipping of Asphalt Emulsion by a Primary Source 5

B. Shipping of Asphalt Emulsion by an Intermediate Supplier..... 6

C. Sampling Asphalt Emulsion Shipments at the Project Site or at Off Site Pugmill Mixers 7

D. Sampling Asphalt Emulsion picked up at Supply Locations in Department Trucks by Maintenance Personnel 9

E. Acceptance or Rejection Action by the Materials Bureau 10

APPENDICES 11-14

III. GENERAL METHOD

The supplier (Primary Source) samples and tests a fixed quantity (lot) of the emulsion and determines, before it is shipped, that it conforms to Department specifications. The lot is then certified to the Department as meeting specifications.

Shipments are made to Department work accompanied by a shipment certification, executed by the supplier, which identifies the shipment as part of the certified lot. This shipment certification is the basis of acceptance for incorporating the emulsion into Department work.

Each shipment of the emulsion is sampled at the project site by a Department representative. Emulsion picked up at a supply location is sampled before being placed in the Department vehicle.

These samples are submitted to the Materials Bureau for testing. Final acceptability of the emulsion is determined by the Materials Bureau based on tests performed on these samples.

IV. DEFINITIONS

1. Primary Source - A supplier, who prior to shipment, samples tests and certifies as meeting Department specifications a tank of asphalt emulsion. The Primary Source is generally the producer of the emulsion and ships either directly to Department work or to an Intermediate Supplier.

2. Intermediate Supplier - A supplier which receives certified asphalt emulsion from a Primary Source for eventual reshipment to Department work or another Intermediate Supplier.

3. Department - The New York State Department of Transportation.

4. Materials Bureau - A facility of the New York State Department of Transportation which may be contacted by mailing to:

   Director of Materials Bureau
   State Campus, Bldg. 7A
   1220 Washington Avenue
   Albany, NY 12232

   OR telephoning the Product Control Office at:

   Area Code 518
   Telephone Number 457-5642

   OR T. W. X. to:

   710-441-88221
   N.Y.S. D.O.T. Albany Campus, Materials Bureau, P. C. O.

5. Region Materials Engineer - A Department representative functioning in a Region whose primary function is to assure the quality of materials used in the construction in that Region.

6. Inspector - A Department representative detailed to supervise or inspect methods and materials relating to Department work.

7. Asphalt Emulsion - An emulsion of asphalt cement, water and emulsifier. Emulsified asphalt may be either anionic with an electro-negatively charged asphalt globules or cationic with electro-positively charged asphalt globules.

8. Specification - Current New York State Department of Transportation Specifications and addenda pertaining to the Contract or Maintenance Project on which the materials will be used.

9. Test Methods - Current Methods used by the Department to test asphalt emulsions. A list of the standard methods used and copies of the special method are available from the Materials Bureau upon request.

10. Certified Lot - A tank of Asphalt Emulsion item represented by a sample which has been tested by the Primary Source and found to be in conformance with Department specifications. The lot is then certified as meeting Department specifications by submitting the test results and a statement of conformance to the Materials Bureau.

11. Lot Number - A number assigned by the Primary Source to each certified lot of bituminous material (asphalt emulsion or cement). The lot numbers shall start with "1" in the beginning of each calendar year. The number shall be assigned regardless of item; i.e., the first lot, a medium setting emulsion, is assigned number "1"; the second lot, a rapid setting emulsion, is assigned number "2"; the third lot, asphalt cement, is assigned number "3". No additional symbols such as letters or year designation should be included with the number.

12. Actual Test - Actual tests performed according to the Department's test methods by the Primary Source on a sample taken from a tank of emulsion that the Primary Source intends to certify as a lot for Department work. The test results of these tests are sent to the Materials Bureau on Form BR 247 - "Certified Test Analysis". Shown below by emulsion type are those properties which require actual tests:

ANIONIC ASPHALT EMULSIONS

TYPE:	RAPID SETTING	MEDIUM SETTING	SLOW SETTING
REQUIRED TEST	Demulsibility Residue by Distillation Oil by Distillation Penetration on Residue	Stone Coating Test Residue by Distillation Oil by Distillation Penetration on Residue Float Test (On High Float Types Only)	Cement Mixing Residue by Distillation Penetration of Residue

NYSDOT
Library
50 Wolf Road, POD 34
Albany, New York 12232

Definition #12 Cont'd.

CATIONIC ASPHALT EMULSIONS

TYPE:	RAPID SETTING	MEDIUM SETTING	SLOW SETTING
REQUIRED TEST	Classification Test Particle Charge Test Residue by Distillation Oil be Distillation Penetration on Residue	Stone Coating Test Particle Charge Test Residue by Distillation Oil by Distillation Penetration on Residue	Particle Charge (or ph) Cement Mixing Test Residue by Distillation Penetration on Residue

13. Sample Valve - A valve installed in each delivery vehicle or distributor for taking samples. The Valve shall be installed at least one foot from the shell and shall be clearly labeled "Sampling Valve" and shall be as those shown in the appendix on page 14 .

14. Transport - A large tanker truck used to deliver asphalt emulsion to central pugmill mixers, travel plant mixers or distributors.

15. Distributor - A tanker truck usually smaller than a transport equipped with a spray bar for doing surface treatment at the project site. Occasionally, transports are equipped with spray bars and act as distributors.

16. Forms - The following forms are published and issued by the Department:

    a. BR 247- Certified Test Analysis - This form is used by the Primary Source to certify lots of asphalt emulsion for use in Department work. Entries on the form include Primary Source identification , emulsion type, lot number and actual test results. This form is submitted to the Materials Bureau immediately after the actual tests are completed. The form is available from the Materials Bureau upon request. An example of Form BR-247 can be found in the appendix on page 11 .

    b. BR-162 - Bituminous Material Certified Shipment Notice - This form is used by a supplier to certify that the shipment it accompanies and identifies is from a certified lot of asphalt emulsion. Examples of Form BR 162 can be found in the appendix on pages 12 & 13.

    c. BR-170- Bitumen or Mix Sample - This form is used by the Inspector to transmit a bitumen sample to the Materials Bureau for test. The green copy of this form is returned to the Region submitting the sample by the Materials Bureau marked "Sample Received" and serves as a sample receipt. Example of Form BR-170 can be found in the Appendix, page 11.

    d. BR-192- Rejection of Bituminous Materials - This form is used by the Materials Bureau as the written notification of a rejected sample. It is issued to the Regional Office with copies to the Primary Source and the Highway Maintenance Subdivision (Main Office).

V. EVIDENCE OF ACCEPTABILITY

For each shipment of emulsion to be used at the project site, at an off site pugmill mixer, or for shipments picked up at supply locations in Department maintenance vehicles, a form BR-162 "Bituminous Material Certified Shipment Notice" prepared by the supplier is required. However, this initial acceptance does not preclude that material represented by samples taken by the Inspector may be rejected on the basis of Materials Bureau tests.

VI. STEPS IN PROCEDURE

A. Testing, Certifying, and Shipping of Asphalt Emulsion by a Primary Source.

B. Shipping of Asphalt Emulsion by an Itermediate Supplier.

C. Sampling Asphalt Emulsion Shipments at the Project Site or at Off Site Pugmill Mixers.

D. Sampling Asphalt Emulsion picked up at Supply Locations in Department Trucks by Maintenance Personnel.

E. Acceptance or Rejection Action by the Materials Bureau.

A. Testing, Certifying and Shipping of Asphalt Emulsion by a Primary Source

Responsibility	Action
Primary Source	1. Produces or receives the emulsion item and stores it in a tank at his facility. a. The quality assurance for the asphalt base used to produce the emulsion is the responsibility of the producer of the base and the Primary Source.
	2. Obtains a representative sample from the lot.
	3. Performs actual required tests on the sample in accordance with Department test methods. A list of the required actual tests for each emulsion type can be found under the definition of "Actual Test" on pages 3 and 4.
	4. Determines that the test results conforms to Department specifications. a. After a lot has been sampled,

Responsibility	Action
Primary Source	4.a tested and found to conform to Department specifications, no new material may be added to the lot.
	5. Assigns a lot number to the lot.
	6. Completes form BR-247, entering the actual test results, the assigned lot number and other required information. Signs and dates the certification statement at the bottom of the form. (See appendix page 11 for an example of a completed BR-247.) a. The person signing the form must have legal authority to represent the Primary Source.
	7. Submits the form BR-247 to the Materials Bureau.
	8. Completes form BR-162- "Bituminous Material Certified Shipment Notice" for each shipment from the certified lot intended for Department work. This includes shipments directly to a Department project, pickups by Department maintenance vehicles or shipments to Intermediate Suppliers for eventual reshipment to Department work.
	9. Ships from the certified lot and distributes the copies of the form BR-162 as shown on the form.

Note to Primary Source:

All vehicles used to ship emulsion to Department work must be equipped with a clearly labeled sample valve. For further information on "sample valves", see pages 4 and 14.

B. Shipping of Asphalt Emulsion by an Intermediate Supplier

Responsibility	Action
Intermediate Supplier	1. Receives a shipment of asphalt emulsion from a Primary Source's certified lot.
	2. Determines that properly filled out form BR-162 "Bituminous Materials Certified Shipment Notice" accompanies the shipment.

Responsibility	Action
Intermediate Supplier	3. Places the asphalt emulsion item into a clean empty tank for storage. a. Only asphalt emulsion from the same lot may be added to the tank. 4. Completes form BR-162 for each shipment from the certified lot intended for Department work. The Primary Source and lot number shown on the form BR-162 received with the emulsion should be entered on this new form BR-162. (See appendix page 13 for an example of a BR-162 executed by an Intermediate Supplier). 5. Ships from the certified lot and distributes the copies of the form BR-162 as shown on the form.

Note to Intermediate Supplier:

All vehicles used to ship emulsion to Department work must be equipped with a clearly labeled sample valve. For further information on sampling valves, see pages 4 and 14.

C. Sampling Asphalt Emulsion Shipments at the Project Site or at Off Site Pugmill Mixers

Responsibility	Action
Inspector	1. Receives the shipment of emulsion and acquires the form BR-162 Bituminous Materials Certified Shipment Notice for the shipment. a. Determines that the form BR-162 is properly filled out and represents the shipment. 2. Samples vehicles according to the following frequency: a. At the project site samples all transports and distributors arriving at the project site. 1. In addition, when a distributor remains at the project site and is fed by arriving transports, a sample should be taken from the distributor each time a different emulsion item is introduced into the distributor.

Responsibility	Action
Inspector	2. b. At off site pugmill mixing operations samples all arriving vehicles.
	3. Locates the sample valve in the vehicle. a. If there is no sample valve in the vehicle, immediately notify, for further instructions, the Engineer; i.e., the Project Engineer, or Resident Engineer for maintenance work.
	4. Draws off and wastes at least one gallon of emulsion before filling the sample container.

Note To Inspector:

It is absolutely essential that at least one (1) gallon of emulsion be drawn off and wasted from the sampling valve prior to filling the sample container. This practice insures that the sampling valve is cleaned out and a truly representative sample is obtained.

5. Fills the sample container directly from the sample valve using the one quart plastic container with screw top supplied by the Materials Bureau. The sample container should be filled completely.

   NOTE: The sample represents all the emulsion in the vehicle sampled.

6. Marks the sample container with the Primary Source, Lot No. (from the BR-162), quantity, sample date and sample time.

7. Completes form BR-170 "Bitumen and Mix Sample" for each sample and distributes as follows:
   a. Affix the white card copy to the sample container.
   b. Enclose the white and green copies in a plain envelope and places it inside the wrapping of the sample package.
   c. Forward yellow to Regional Materials Engineer.
   d. Retain pink copy.

   NOTE: See appendix page 11 for an example of a completed BR-170.

Responsibility	Action
Inspector	8. Transmits the sample to the Materials Bureau as soon as practicable, but within five (5) working days after sampling. a. Consults Regional Materials Engineer for most economical way to transmit the sample. b. Samples should not be exposed to freezing temperatures.

D. Sampling Asphalt Emulsion picked up at Supply Locations in Department Trucks by Maintenance Personnel.

Responsibility	Action
Inspector (Maintenance employee assigned to pick-up emulsion)	1. Arrives at the emulsion supplier. 2. Asks the supplier to show him the location of the sample valve in the supply tank.

Note to Inspector:
It is imperative that the sample be taken from the supplier's tank rather than the Department vehicle.

	3. Determines from the supplier the quantity of emulsion that must be drawn off to clear the sample valve. 4. Draws off the quantity specified by the supplier before filling the sample container. 5. Fills the sample container directly from the sample valve using a one quart plastic container supplied by the Materials Bureau. NOTE: The sample shall represent all the emulsion from that tank picked up by the Department at that time.
Supplier (Primary Source or Intermediate Supplier)	6. Fills the Department vehicle with the emulsion. 7. Completes form BR-162 "Bituminous Material Certification Notice" for the shipment and gives the "with shipment" copy to the Inspector and distributes the other copies as shown on the form.
Inspector	8. Marks sample container with Primary Source, lot No., quantity, sample date and time.

Responsibility	Action
Inspector	8. (cont'd) NOTE: The name of the Primary Source and lot No. are found on the form BR-162. 9. Completes form BR-170 "Bitumen and Mix Sample" and distributes as follows: a. Affix white card copy to sample container. b. Enclose white and green copies in a plain envelope and place it inside the wrapping of the sample package. c. Forward yellow copy to Regional Materials Engineer. d. Retain pink copy. NOTE: For an example a completed BR-170 see appendix page 11. 10. Transmits the sample as soon as practicable to the Materials Bureau but within five (5) working days after sampling.

E. Acceptance or Rejection Action by the Materials Bureau

Responsibility	Action
Materials Bureau	1. Receives sample. 2. Stamps green copy of form BR-170 with "SAMPLE RECEIVED" and sends via Regional Office to project or residency. 3. Tests sample, if sample passes, no further action necessary. -THE FOLLOWING PERTAINS TO REJECTED SAMPLE ONLY- 4. Notifies Regional Materials Engineer of rejected sample by telephone. 5. Notifies, in writing, the Regional Office Highway Maintenance Subdivision and Primary Source, using form BR-192 "Rejection of Bituminous Materials."

APPENDIX

"Examples of Forms"

1. Form BR247 - CERTIFIED TEST ANALYSIS - Used by the Primary Source to certify the asphalt emulsion as conforming to Department specifications and to submit actual test results to the Materials Bureau.

BR-247B (5/76)

CERTIFIED TEST ANALYSIS

Lot No. 4
N.Y.S. Item No. 702-32
Grade MS-2
Gallons @ 60°F. 50,000

PRIMARY SOURCE: Name Eksalp Emulsion, Inc.
Address Main St.
Mixville, NY Zip 14302
Telephone No.: Area Code 518 - 467-5825

CUTBACKS		EMULSIONS		ASPHALTS & ROAD TARS
Certified Test Results:		Certified Test Results:		Certified Test Results:
Kinematic Vis. @ 140°F. cs		Asphalt %	65	Water %
Distillation - % by Vol.		Cement Mixing		Sp. Gr. @ °F./ °C.
to 374°F.		Demulsibility N/50		Pen. @ 77°F.
to 437°F.		Demulsibility N/10		Pen. Ratio
to 500°F.		Pen. Distl. Res. @ 77°F.	140	Flash Point °F.
to 600°F.		% Oil of Distillate (Based on Tot. Emul.)	5.0	Engler, Sp.Vis. @ 40°C.
Residue from Distl. to 680°F % Vol. by Dif.		Stone Coating	Passes	Engler, Sp.Vis. @ 50°C.
Stone Coating (Stripping)		FLOAT TEST @ 140°F. SEC.		Float Test @ 32°C.
				Float Test @ 50°C.
				Distillation - % by Wt.
				to 170°C.
				to [illegible]°C.
				to 235°C.
				to 270°C.
				to 300°C.

I HEREBY CERTIFY THAT THE ABOVE MATERIAL CONFORMS TO N.Y.S.D.O.T. SPECIFICATIONS.

AUTHORIZED SIGNATURE: Edward Butwater

TITLE: Plant Chemist DATE: 7/25/76

INSTRUCTIONS: USE THIS FORM FOR ALL BITUMINOUS MATERIAL OTHER THAN ASPHALT CEMENT. FOR ASPHALT CEMENT USE BR-301A

THIS FORM SUPPLIED BY N.Y.S.D.O.T. - MATERIALS BUREAU
1220 WASHINGTON AVE., ALBANY, NY 12232

2. Form BR170 - BITUMEN OR MIX SAMPLE - Used by the Inspector to submit samples to the Materials Bureau.

FORM BR-170b (9/68)
NEW YORK STATE
DEPT. OF TRANSPORTATION
MATERIALS BUREAU

BITUMEN OR MIX SAMPLE

FOR LAB USE ONLY
TEST NO.
DATE REC'D.

SEE REVERSE SIDE FOR INSTRUCTIONS

SERIAL NO. 77684

PRIMARY SOURCE* Eksalp Emulsions, Inc.
LOCATION* Mixville, NY

LOT NO.*	ITEM NO.*†	GRADE TYPE*†	DATE SAMPLED*†	TIME SAMPLED*†
4	702-32	MS-2	8/5/76	11:00 am

SAMPLED BY**	DISTRICT NO.*	JOB-MIX FORM. NO.†	TONS REPRESENTED†
Joseph Bushey	2		

COMPLETE THIS SECTION FOR SAMPLES TAKEN AT BITUMINOUS CONCRETE PLANT.

NAME OF OWNER*†
LOCATION*†
REMARKS:*†

COMPLETE THIS SECTION FOR SAMPLES TAKEN AT PROJECT SITE.

NAME OF SUPPLIER*† Applicators, Inc.
LOCATION*† Brown, NY
CONT. OR HM NO.*† 034000
VEHICLE NO.* TY722
STATION AND LANE*† EB 25+50 to 26+75
GALS. RCP. AT 60° F.* 5200

DISTRIBUTION – • Yellow to Dist. File • Pink to Inspector • White & Green to Materials Bureau within Sample Pkg. • White Card (Part #5) – Affix to Sample Container

COMPLETE FOR BITUMEN SAMPLE*
COMPLETE FOR MIX SAMPLE†
COMPLETE FOR EITHER TYPE OF SAMPLE*†

APPENDIX (CONT'T)

3. Form BR162 - BITUMINOUS MATERIAL CERTIFIED SHIPMENT NOTICE - Used by the Primary Source, (Eksalp Emulsion, Inc.) for a shipment to the Intermediate Supplier (Applicators, Inc.)
   Note: Since Eksalp Emulsion, Inc. is the Supplier as well as the Primary Source, Eksalp Emulsion Inc. should be entered on the form as Primary Source and Supplier.

BR 162a (10-70)

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION
MATERIALS BUREAU

BITUMINOUS MATERIAL
CERTIFIED SHIPMENT NOTICE

DEL. TKT. NO. 10421
ITEM 702-32
GRADE MS-2
% ADDITIVE

PRIMARY SOURCE	LOCATION	LOT NO.
Eksalp Emulsion, Inc.	Mixville, NY	4

SUPPLIER	LOCATION
Eksalp Emulsion, Inc.	Mixville, NY

SHIPMENT DESTINATION	LOCATION
Applicators, Inc.	Brown, NY

GAL. @ 60 F	SPEC. GRAVITY @ 60 F	VEHICLE NO.	CONTRACT NO.
20,000	1.01	NY206	-

SHIPPED IN	BULK TRANSPORT	BULK R.R.	BULK BARGE	BARRELS	DISTRIBUTOR
	☐	☒	☐	☐	☐

Complete the following section for LINE BLENDED BITUMENS ONLY.

ITEM GRADE	PRIMARY SOURCE	LOCATION	LOT NO.	GALLONS @ 60 F	% TOTAL	SPEC. GRAVITY @ 60 F

The above indicated material has been tested and a CERTIFIED TEST REPORT, dated 7/25/76, indicating conformance with all requirements of applicable Department Specifications, is on file.

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT TO THE BEST OF MY KNOWLEDGE.

Jim Candelet
Authorized Signature (For Supplier)

Dispatcher
Title

7/28/76
Date

DISTRIBUTION: BLUE-With Shipment YELLOW-To Mat. Bur. (for line blend only) PINK-To Region WHITE-Supplier

SEE INSTRUCTIONS ON REVERSE SIDE

APPENDIX (CONT'D)

4. Form BR162 - BITUMINOUS MATERIAL CERTIFIED SHIPMENT NOTICE - For a shipment from the Intermediate Supplier (Applicator Inc.) to the contractor (Paving Construction Co.) on project D94000 in Utica, NY.

BR-162b (10 70)

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION
MATERIALS BUREAU

BITUMINOUS MATERIAL
CERTIFIED SHIPMENT NOTICE

DEL. TKT. NO. 20651
ITEM 702-32
GRADE MS-2
% ADDITIVE

PRIMARY SOURCE	LOCATION	LOT NO.
Eksalp Emulsion, Inc.	Mixville, NY	4
SUPPLIER	**LOCATION**	
Applicators, Inc.	Brown, NY	
SHIPMENT DESTINATION	**LOCATION**	
Paving Construction Co.	Utica, NY	

GAL. @ 60 F	SPEC. GRAVITY @ 60 F	VEHICLE NO.	CONTRACT NO.
5200	1.01	TY722	D94000

SHIPPED IN: [X] BULK TRANSPORT [ ] BULK R.R. [ ] BULK BARGE [ ] BARRELS [ ] DISTRIBUTOR

Complete the following section for LINE BLENDED BITUMENS ONLY.

ITEM GRADE	PRIMARY SOURCE	LOCATION	LOT NO.	GALLONS @ 60 F	% TOTAL	SPEC. GRAVITY @ 60 F

The above indicated material has been tested and a CERTIFIED TEST REPORT, dated 7/25/76, indicating conformance with all requirements of applicable Department Specifications, is on file.

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT TO THE BEST OF MY KNOWLEDGE.

John Krolrom
Authorized Signature (For Supplier)

Dispatcher
Title

8/5/76
Date

DISTRIBUTION: BLUE–With Shipment YELLOW–To Mat. Bur. (for line blend only) PINK–To Region WHITE–Supplier

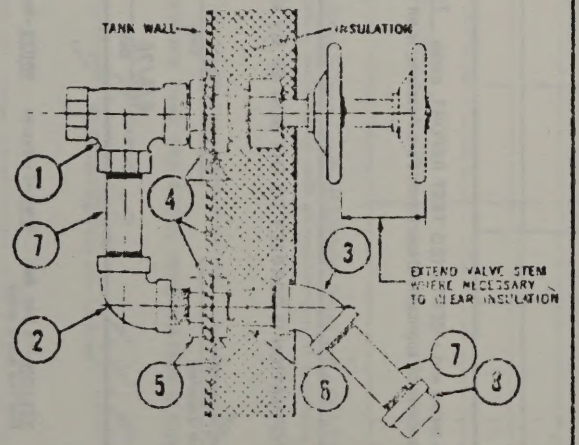
SEE INSTRUCTIONS ON REVERSE SIDE

SAMPLING VALVE AS RECOMMENDED BY THE ASPHALT INSTITUTE

SAMPLING VALVE AS RECOMMENDED BY THE TRUCK TRAILER MANUFACTURERS ASSOCIATION

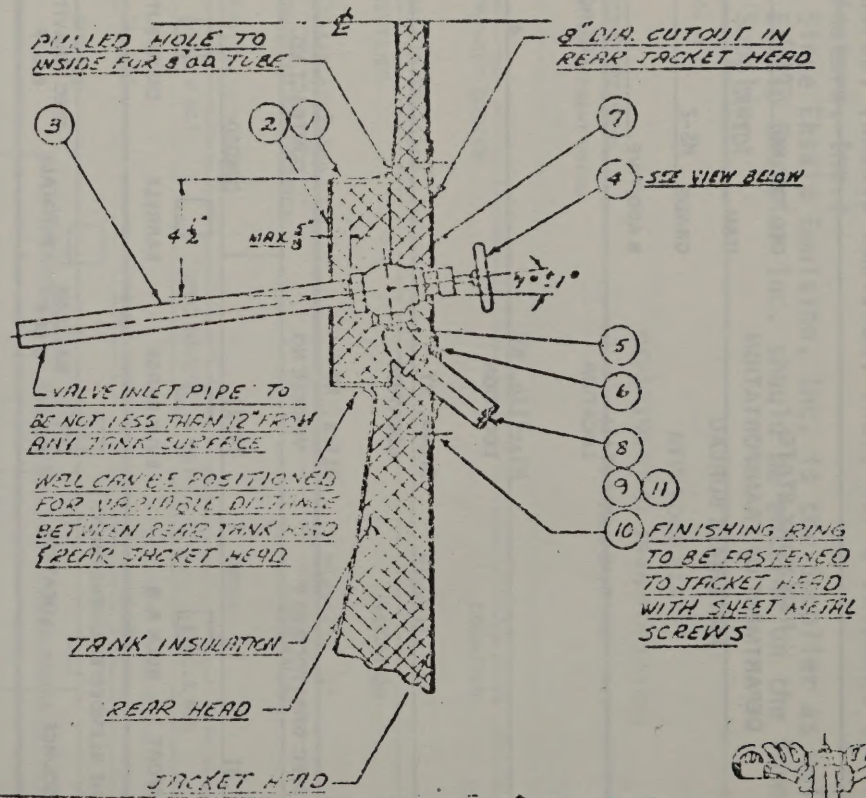
NOTE: Sampling valves on distributors or delivery vehicles serving Department projects shall be similar to either of these two.

Figure 1. Submerged Asphalt sampling device.

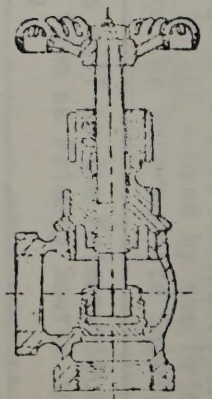


MOUNT IN LOWER HALF OF THE BULKHEAD AT LEAST 1'-0" FROM THE SHELL

REF. No.	DESCRIPTION	No. REQ.
1	¾" 'VOGT' P-9844 STEEL ANGLE VALVE OR SIMILAR, PANEL MOUNTED	1
2	¾" STEEL OR MALL. IRON 90° ELBOW	1
3	¾" STEEL OR MALL. IRON 45° ELBOW	1
4	ASBESTOS GASKETS SNUG ON THREAD OR WOUND WITH YARN	4
5	¾" 150# SCREWED M. I. LOCKNUT	2
6	¾" x 3½" = PARALLEL THREADED STEEL PIPE NIPPLE (CUT FROM ¾" STD. TANK NIPPLE IF OTHERWISE UNOBTAINABLE)	1
7	¾" x 3" THREADED STEEL PIPE NIPPLE	2
8	¾" MALL. IRON PIPE CAP	1



1	1	2780020	COLLAR-RECESS, SAMPLE VALVE
2	1	2780019	PLATE-END, RECESS, SAMPLE VALVE
3	1	6200284	PIPE-INLET, ¾" x 13 LG. T.O.E.
4	1	6600349	VLV.-¾", ANGLE, CRANE, #2
5	1	0140798	ELBOW-45° STREET, ¾"
6	1	2750166	RING-FIN, THERM. WELL
7	1	2780021	RING-FIN, RECESS, SAMPLE VALVE
8	1	0190724	NIPPLE PIPE, ¾" x 4" LG.
9	1	2780033	CAP ASM.- SAMPLING VALVE
10	12	0144736	SCREW- PARKER KALON, #14
11	2	6000435	RIVET- SOUTHCO, #38-106-05, 3/16 x 9/32 LG.



TYPICAL SECTION VIEW OF VALVE (¾ BRONZE ANGLE)

01480
LRI